

Complete Summary

GUIDELINE TITLE

Preservation of fertility in pediatric and adolescent patients with cancer.

BIBLIOGRAPHIC SOURCE(S)

Fallat ME, Hutter J, American Academy of Pediatrics Committee on Bioethics, American Academy of Pediatrics Section on Hematology/Oncology, American Academy of Pediatrics Section on Surgery. Preservation of fertility in pediatric and adolescent patients with cancer. Pediatrics 2008 May;121(5):e1461-9. [82 references] [PubMed](#)

GUIDELINE STATUS

This is the current release of the guideline.

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COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

- Childhood cancer
- Infertility
- Sterility

GUIDELINE CATEGORY

Counseling
Evaluation

CLINICAL SPECIALTY

Endocrinology
Family Practice
Hematology
Oncology
Pediatrics
Psychology
Radiation Oncology

INTENDED USERS

Allied Health Personnel
Physicians
Psychologists/Non-physician Behavioral Health Clinicians

GUIDELINE OBJECTIVE(S)

To provide guidance for counseling of parents and patients about preservation of fertility options in children and adolescents with cancer

TARGET POPULATION

Children and adolescents with solid tumors and hematologic malignancies

INTERVENTIONS AND PRACTICES CONSIDERED

1. Counseling of parents and patients regarding fertility preservation
2. Evaluation of candidacy for fertility preservation
3. Cryopreservation of sperm
4. Fertility-preservation options for female children and adolescents
5. Outlining of instructions concerning disposal of stored gametes, embryos or gonadal tissue

MAJOR OUTCOMES CONSIDERED

- Incidence and prevalence of sterility
- Incidence and prevalence of clinical infertility
- Pregnancy rate after fertility preservation
- Success rate in creating a viable embryo that results in a living child after sperm cryopreservation
- Rate of pregnancy resulting in successful delivery after cryopreservation of oocytes

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Medline was searched through Ovid for a period of 10 years using the keys words: children, cancer, chemotherapy, radiation therapy, subfertility, infertility, ethics. This resulted in over 100 articles. Initial references chosen included position statements and guidelines concerning adult cancer survivors from national organizations on this topic, in addition to original articles specifically addressing the topic in the pediatric literature. The reference lists in articles were then used to obtain the original literature from the 1970s and 1980s that addressed this topic. Additional information regarding development of sexual reproduction in children was sought from the reference lists of the primary articles chosen for the review. Additional articles were added when recommended by reviewers to strengthen the evidence or opinions presented in the text.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

All source materials were obtained and read by the first author in preparation of the manuscript.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

The costs of fertility preservation are unlikely to be covered by insurance, although the psychological distress and effects of infertility are well documented. Therefore, patients and their families become responsible for all of the costs. Although some techniques are considered experimental and are, therefore, of unproven benefit, sperm preservation is a technique that has been used for many years and has associated benefits and a record of success that would allow for a change in coverage for this option.

The cost of sperm cryopreservation after masturbation was estimated in 2006 at approximately \$1500 for 3 samples stored for 3 years, with additional costs incurred if alternative methods were needed to obtain sperm or for prolonged storage.

The costs of ovarian-tissue preservation can be separated into 3 parts: (1) the procedure to retrieve the tissue, generally laparoscopy and attendant anesthesia (2) ovarian-tissue pathologic evaluation and freezing; and (3) the annual cost of ovarian-tissue storage. This cost estimate does not include the initial screening and evaluation costs performed before in vitro fertilization or the costs of estradiol testing during therapy (typically 5 blood tests at approximately \$200 per sample). Egg retrieval, anesthesia, egg cryopreservation, and the first year of frozen-egg storage costs can be estimated at \$5538.

Laparoscopic procedures, even in children, often can be performed on an outpatient basis, precluding any inpatient hospitalization cost. The cost of ovarian-tissue freezing alone might be similar to that of freezing of testicular sperm after testicular dissection (see previous discussion), and the annual cost of ovarian-tissue storage is similar to that of embryo cryopreservation, which costs approximately \$350 to \$500 per year. Assuming recovery of the patient after treatment, the costs will then include tissue thawing and the procedure for autotransplantation, subsequent medications/hormones, and laboratory testing. The cost of subsequent thawing, culture, fertilization, and embryo transfer followed by 1 pregnancy blood test can be estimated at \$3162. Separate costs would include the medication costs necessary for cycling at \$2000 to \$4000 per cycle, and \$330 per ultrasonographic examination. The need for more sophisticated assisted reproduction techniques, such as intracytoplasmic sperm injection, would add additional costs. Use of ovarian suppression with gonadotropin-releasing hormone analogs or antagonists to ovarian tissue during chemotherapy or radiation therapy costs approximately \$500 per month.

METHOD OF GUIDELINE VALIDATION

External Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The article was reviewed by experts in the field of Reproductive Endocrinology, including ethicists.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Guidance for Counseling of Parents and Patients About Preservation of Fertility Options in Children and Adolescents with Cancer

Evaluation of candidacy for fertility preservation should involve a team of specialists, including a pediatric oncologist and/or radiation oncologist, a fertility specialist, an ethicist, and a mental health professional.

1. Cryopreservation of sperm should be offered whenever possible to male patients or families of male adolescents.
2. Current fertility-preservation options for female children and adolescents should be considered experimental and are offered only in selected institutions in the setting of a research protocol.
3. In considering actions to preserve a child's fertility, parents should consider a child's assent, the details of the procedure involved, and whether such procedures are of proven utility or experimental in nature. In some cases, after such consideration, acting to preserve a child's fertility may be appropriate.
4. Instructions concerning disposition of stored gametes, embryos, or gonadal tissue in the event of the patient's death, unavailability, or other contingency should be legally outlined and understood by all parties, including the patient if possible.
5. Concerns about the welfare of a resultant offspring with respect to future cancer risk should not be a cause for denying reproductive assistance to a patient.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence supporting the recommendations is not specifically stated.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate counseling of parents and patients regarding preservation of fertility in children and adolescents being treated for cancer

POTENTIAL HARMS

Fertility preservation raises several ethical issues, including disclosure of the reproductive consequences of therapy, evidence regarding the options for fertility preservation in the setting of available techniques, cultural issues, the consent process, and the dilemma of counseling someone who has not yet reached adulthood to make decisions concerning his or her reproductive health while facing the treatment of a life-altering disease. Recognizing that fertility preservation may create both burdens and opportunities for patients with cancer, discussions regarding reproductive potential should take place in the context of maximizing the child's future options and well-being.

CONTRAINDICATIONS

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The collection of mature oocytes requires ovarian stimulation, has been used only in adult patients to date, and may be contraindicated if a cancer is estrogen sensitive.

QUALIFYING STATEMENTS

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The guidance in this report does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2008 May

GUIDELINE DEVELOPER(S)

American Academy of Pediatrics - Medical Specialty Society

SOURCE(S) OF FUNDING

American Academy of Pediatrics

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Section on Hematology/Oncology

Section on Surgery

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

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GUIDELINE AVAILABILITY

Electronic copies: Available from the [American Academy of Pediatrics \(AAP\) Policy Web site](#).

Print copies: Available from American Academy of Pediatrics, 141 Northwest Point Blvd., P.O. Box 927, Elk Grove Village, IL 60009-0927.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI Institute on April 7, 2009. The information was verified by the guideline developer on April 23, 2009.

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